

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Withdrawn) A method of manufacturing a semiconductor device comprising the steps of:

adding a metallic element to a first semiconductor film having an amorphous structure;

crystallizing the first semiconductor film to form a first semiconductor film having a crystalline structure;

forming a barrier layer on a surface of the first semiconductor film having a crystalline structure;

forming a second semiconductor film on the barrier layer;

forming a third semiconductor film comprising ~~an inert~~ a noble gas element on the second semiconductor film;

gettering the metallic element into the third semiconductor film to remove or reduce the amount of the metallic element within the first semiconductor film having a crystalline structure; and

removing the second semiconductor film and the third semiconductor film.

2. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the step of forming of the third semiconductor film comprises steps of forming a semiconductor film and adding ~~an inert~~ a noble gas element to the semiconductor film.

3. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the step of forming of the third semiconductor film comprises a step of

forming a semiconductor film comprising ~~an inert~~ a noble gas element by using plasma CVD or reduced pressure thermal CVD.

4. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the step of forming of the third semiconductor film comprises a step of forming a third semiconductor film comprising ~~an inert~~ a noble gas element by using sputtering.

5. (Withdrawn) A method of manufacturing a semiconductor device according to claim 3, comprising the step of forming the third semiconductor film comprising ~~an inert~~ a noble gas element and further adding ~~an inert~~ a noble gas element to the third semiconductor film.

6. (Withdrawn) A method of manufacturing a semiconductor device according to claim 4, comprising the step of forming the third semiconductor film comprising ~~an inert~~ a noble gas element and further adding ~~an inert~~ a noble gas element to the third semiconductor film.

7. (Withdrawn) A method of manufacturing a semiconductor device according to claim 2, comprising the step of adding one element or a plurality of elements chosen from the group consisting of O, O₂, P, H, and H₂ in addition to the ~~[[inert]]~~ noble gas element.

8. (Withdrawn) A method of manufacturing a semiconductor device according to claim 5, comprising the step of adding one element or a plurality of elements chosen from the group consisting of O, O₂, P, H, and H₂ in addition to the ~~[[inert]]~~ noble gas element.

9. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the third semiconductor film is a semiconductor film having an amorphous structure or a crystalline structure.

10. (Withdrawn) A method of manufacturing a semiconductor device comprising the steps of:

adding a metallic element to a first semiconductor film having an amorphous structure;

crystallizing the first semiconductor film to form a first semiconductor film having a crystalline structure;

forming a barrier layer on a surface of the first semiconductor film having a crystalline structure;

forming a second semiconductor film on the barrier layer;

adding ~~an inert~~ a noble gas element to an upper layer of the second semiconductor film;

gettering the metallic element into the upper layer of the second semiconductor film to remove or reduce the amount of the metallic element within the first semiconductor film having a crystalline structure; and

removing the second semiconductor film.

11. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, comprising the step of adding one element or a plurality of elements chosen from the group consisting of O, O₂, P, H, and H₂ in addition to the ~~[[inert]]~~ noble gas element.

12. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the second semiconductor film is a semiconductor film having an amorphous structure or a crystalline structure.

13. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the second semiconductor film is a semiconductor film having an amorphous structure or a crystalline structure.

14. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the metallic element is one element or a plurality of elements chosen from the group consisting of Fe, Ni, Co, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.

15. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the metallic element is one element or a plurality of elements chosen from the group consisting of Fe, Ni, Co, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.

16. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the step of crystallizing the first semiconductor film is a heat treatment process.

17. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the step of crystallizing the first semiconductor film is a heat treatment process.

18. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the step of crystallizing the first semiconductor film is a process of irradiating strong light to the semiconductor film having an amorphous structure.

19. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the step of crystallizing the first semiconductor film is a process of irradiating strong light to the semiconductor film having an amorphous structure.

20. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the step of crystallizing the first semiconductor film is a heat treatment process and a process of irradiating strong light to the semiconductor film having an amorphous structure.

21. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the step of crystallizing the first semiconductor film is a heat treatment process and a process of irradiating strong light to the semiconductor film having an amorphous structure.

22. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the step of forming the barrier layer is a step of oxidizing a surface of the semiconductor film having a crystalline structure by using a solution containing ozone.

23. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the step of forming the barrier layer is a step of oxidizing a surface of the semiconductor film having a crystalline structure by using a solution containing ozone.

24. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the step of forming the barrier layer is a step of oxidizing a surface of the semiconductor film having a crystalline structure by irradiating ultraviolet light.

25. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the step of forming the barrier layer is a step of oxidizing a surface of the semiconductor film having a crystalline structure by irradiating ultraviolet light.

26. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the step of gettering is a heat treatment process.

27. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the step of gettering is a heat treatment process.

28. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the step of gettering is a process of irradiating strong light to the semiconductor film.

29. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the step of gettering is a process of irradiating strong light to the semiconductor film.

30. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the step of gettering is a heat treatment process and a process of irradiating strong light to the semiconductor film.

31. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the step of gettering is a heat treatment process and a process of irradiating strong light to the semiconductor film.

32. (Withdrawn) A method of manufacturing a semiconductor device according to claim 18, wherein the strong light is light emitted from a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high pressure sodium lamp, or a high pressure mercury lamp.

33. (Withdrawn) A method of manufacturing a semiconductor device according to claim 19, wherein the strong light is light emitted from a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high pressure sodium lamp, or a high pressure mercury lamp.

34. (Withdrawn) A method of manufacturing a semiconductor device according to claim 20, wherein the strong light is light emitted from a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high pressure sodium lamp, or a high pressure mercury lamp.

35. (Withdrawn) A method of manufacturing a semiconductor device according to claim 21, wherein the strong light is light emitted from a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high pressure sodium lamp, or a high pressure mercury lamp.

36. (Withdrawn) A method of manufacturing a semiconductor device according to claim 28, wherein the strong light is light emitted from a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high pressure sodium lamp, or a high pressure mercury lamp.

37. (Withdrawn) A method of manufacturing a semiconductor device according to claim 29, wherein the strong light is light emitted from a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high pressure sodium lamp, or a high pressure mercury lamp.

38. (Withdrawn) A method of manufacturing a semiconductor device according to claim 30, wherein the strong light is light emitted from a halogen lamp, a metal halide

lamp, a xenon arc lamp, a carbon arc lamp, a high pressure sodium lamp, or a high pressure mercury lamp.

39. (Withdrawn) A method of manufacturing a semiconductor device according to claim 31, wherein the strong light is light emitted from a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high pressure sodium lamp, or a high pressure mercury lamp.

40. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the ~~[[inert]]~~ noble gas element is one element or a plurality of elements chosen from the group consisting of He, Ne, Ar, Kr, and Xe.

41. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the ~~[[inert]]~~ noble gas element is one element or a plurality of elements chosen from the group consisting of He, Ne, Ar, Kr, and Xe.

42. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the third semiconductor film further comprises one element or a plurality of ~~element~~ elements selected ~~[[form]]~~ from the group of O, O₂, P, H, H₂.

43. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the third semiconductor film further comprises one element or a plurality of ~~element~~ elements selected ~~[[form]]~~ from the group of O, O₂, P, H, H₂.

44. (Withdrawn) A method of manufacturing a semiconductor device according to claim 1, wherein the third semiconductor film comprises ~~an-inert~~ a noble gas element at a concentration of 1×10^{19} to 1×10^{22} /cm³.

45. (Withdrawn) A method of manufacturing a semiconductor device according to claim 10, wherein the second semiconductor film ~~is added~~ comprises an inert a noble gas element at a concentration of 1×10^{19} to 1×10^{22} /cm³.

46. (Withdrawn) A method of manufacturing a semiconductor device comprising:

forming a first semiconductor film having an amorphous structure over a substrate;

providing the first semiconductor film with a material for promoting crystallization;

heating the first semiconductor film for crystallizing;

irradiating the first semiconductor film with a laser light for improving crystallinity;

forming a barrier layer over the first semiconductor film having a crystalline structure;

forming a second semiconductor film over the barrier layer;

forming a third semiconductor film over the second semiconductor film, the third semiconductor film comprising ~~an inert~~ a noble gas element;

gettering the material for promoting crystallization into the third semiconductor film.

47. (Currently Amended) A method of manufacturing a semiconductor device comprising:

forming a first semiconductor film having an amorphous structure over a substrate;

providing the first semiconductor film with a material for promoting crystallization;

heating the first semiconductor film for crystallizing;

irradiating the first semiconductor film with a laser light for improving crystallinity;

forming a barrier layer over the first semiconductor film having a crystalline structure;

forming a second semiconductor film over the barrier layer;
adding ~~an inert~~ a noble gas element to an upper layer of the second semiconductor film;
gettering the material for promoting crystallization into the upper layer of the second semiconductor film.

48. (Currently Amended) A method of manufacturing a semiconductor device comprising:

forming a first semiconductor film having an amorphous structure over a substrate;
providing the first semiconductor film with a material for promoting crystallization;
heating the first semiconductor film for crystallizing;
irradiating the first semiconductor film with a laser light for improving crystallinity;
forming a second semiconductor film over the first semiconductor film;
forming a third semiconductor film over the second semiconductor film, the third semiconductor film comprising ~~an inert~~ a noble gas element;
gettering the material for promoting crystallization into the third semiconductor film.

49. (Currently Amended) A method of manufacturing a semiconductor device comprising:

forming a first semiconductor film having an amorphous structure over a substrate;
providing the first semiconductor film with a material for promoting crystallization;
heating the first semiconductor film for crystallizing;
irradiating the first semiconductor film with a laser light for improving crystallinity;
forming a second semiconductor film over the first semiconductor film, the second semiconductor film comprising ~~an inert~~ a noble gas element;

gettering the material for promoting crystallization into the second semiconductor film.

50. (Withdrawn) A method of manufacturing a semiconductor device according to claim 46, wherein the barrier layer is formed by oxidizing a surface of the first semiconductor film by using a solution containing ozone.

51. (Previously Presented) A method of manufacturing a semiconductor device according to claim 47, wherein the barrier layer is formed by oxidizing a surface of the first semiconductor film by using a solution containing ozone.

52. (Withdrawn) A method of manufacturing a semiconductor device according to claim 46, wherein the barrier layer is formed by oxidizing a surface of the first semiconductor film by irradiating ultraviolet light.

53. (Previously Presented) A method of manufacturing a semiconductor device according to claim 47, wherein the barrier layer is formed by oxidizing a surface of the first semiconductor film by irradiating ultraviolet light.

54. (Withdrawn) A method of manufacturing a semiconductor device according to claim 46, wherein the [[inert]] noble gas element is at least an element selected from the group consisting of He, Ne, Ar, Kr and Xe.

55. (Currently Amended) A method of manufacturing a semiconductor device according to claim 47, wherein the [[inert]] noble gas element is at least an element selected from the group consisting of He, Ne, Ar, Kr and Xe.

56. (Withdrawn) A method of manufacturing a semiconductor device according to claim 48, wherein the [[inert]] noble gas element is at least an element selected from the group consisting of He, Ne, Ar, Kr and Xe.

57. (Withdrawn) A method of manufacturing a semiconductor device according to claim 49, wherein the [[inert]] noble gas element is at least an element selected from the group consisting of He, Ne, Ar, Kr and Xe.

58. (Withdrawn) A method of manufacturing a semiconductor device according to claim 46, wherein the third semiconductor film comprises the [[inert]] noble gas element at a concentration of 1×10^{19} to $1 \times 10^{22} / \text{cm}^3$.

59. (Currently Amended) A method of manufacturing a semiconductor device according to claim 47, wherein the second semiconductor film comprises the [[inert]] noble gas element at a concentration of 1×10^{19} to $1 \times 10^{22} / \text{cm}^3$.

60. (Withdrawn) A method of manufacturing a semiconductor device according to claim 48, wherein the third semiconductor film comprises the [[inert]] noble gas element at a concentration of 1×10^{19} to $1 \times 10^{22} / \text{cm}^3$.

61. (Withdrawn) A method of manufacturing a semiconductor device according to claim 49, wherein the second semiconductor film comprises the [[inert]] noble gas element at a concentration of 1×10^{19} to $1 \times 10^{22} / \text{cm}^3$.

62. (Withdrawn) A method of manufacturing a semiconductor device according to claim 46, wherein the semiconductor device is applied to an electronic apparatus selected from the group consisting of a personal computer, a video camera, a mobile

computer, a goggle type display, a DVD, a digital camera, a front type projector, a rear type projector, a mobile phone and an electronic book.

63. (Previously Presented) A method of manufacturing a semiconductor device according to claim 47, wherein the semiconductor device is applied to an electronic apparatus selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle type display, a DVD, a digital camera, a front type projector, a rear type projector, a mobile phone and an electronic book.

64. (Withdrawn) A method of manufacturing a semiconductor device according to claim 48, wherein the semiconductor device is applied to an electronic apparatus selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle type display, a DVD, a digital camera, a front type projector, a rear type projector, a mobile phone and an electronic book.

65. (Withdrawn) A method of manufacturing a semiconductor device according to claim 49, wherein the semiconductor device is applied to an electronic apparatus selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle type display, a DVD, a digital camera, a front type projector, a rear type projector, a mobile phone and an electronic book.

66. (Withdrawn) A method of manufacturing a semiconductor device comprising:

- providing a crystalline semiconductor film comprising silicon over a substrate, said crystalline semiconductor film containing a metallic element;
- forming a barrier layer over the crystalline semiconductor film;
- forming a second semiconductor film over the barrier layer;

forming a third semiconductor film comprising ~~an inert~~ a noble gas element over the second semiconductor film;

gettering the metallic element into the third semiconductor film to remove or reduce the amount of the metallic element within the crystalline semiconductor film; and removing the second semiconductor film and the third semiconductor film.

67. (Withdrawn) A method of manufacturing a semiconductor device comprising:

providing a crystalline semiconductor film comprising silicon over a substrate, said crystalline semiconductor film containing a metallic element;

forming a barrier layer over the crystalline semiconductor film;

forming a second semiconductor film over the barrier layer;

adding ~~an inert~~ a noble gas element to an upper layer of the second semiconductor film;

gettering the metallic element into the upper layer of the second semiconductor film to remove or reduce the amount of the metallic element within the crystalline semiconductor film; and

removing the second semiconductor film.

68. (Withdrawn) A method of manufacturing a semiconductor device according to claim 66, wherein the barrier layer is formed by oxidizing a surface of the first semiconductor film by using a solution containing ozone.

69. (Withdrawn) A method of manufacturing a semiconductor device according to claim 67, wherein the barrier layer is formed by oxidizing a surface of the first semiconductor film by using a solution containing ozone.

70. (Withdrawn) A method of manufacturing a semiconductor device according to claim 66, wherein the barrier layer is formed by oxidizing a surface of the first semiconductor film by irradiating ultraviolet light.

71. (Withdrawn) A method of manufacturing a semiconductor device according to claim 67, wherein the barrier layer is formed by oxidizing a surface of the first semiconductor film by irradiating ultraviolet light.

72. (Withdrawn) A method of manufacturing a semiconductor device according to claim 66, wherein the [[inert]] noble gas element is at least an element selected from the group consisting of He, Ne, Ar, Kr and Xe.

73. (Withdrawn) A method of manufacturing a semiconductor device according to claim 67, wherein the [[inert]] noble gas element is at least an element selected from the group consisting of He, Ne, Ar, Kr and Xe.

74. (Withdrawn) A method of manufacturing a semiconductor device according to claim 66, wherein the third semiconductor film comprises the [[inert]] noble gas element at a concentration of 1×10^{19} to $1 \times 10^{22} / \text{cm}^3$.

75. (Withdrawn) A method of manufacturing a semiconductor device according to claim 67, wherein the second semiconductor film comprises the [[inert]] noble gas element at a concentration of 1×10^{19} to $1 \times 10^{22} / \text{cm}^3$.

76. (Withdrawn) A method of manufacturing a semiconductor device according to claim 66, wherein the semiconductor device is applied to an electronic apparatus selected from the group consisting of a personal computer, a video camera, a mobile

computer, a goggle type display, a DVD, a digital camera, a front type projector, a rear type projector, a mobile phone and an electronic book.

77. (Withdrawn) A method of manufacturing a semiconductor device according to claim 67, wherein the semiconductor device is applied to an electronic apparatus selected from the group consisting of a personal computer, a video camera, a mobile computer, a goggle type display, a DVD, a digital camera, a front type projector, a rear type projector, a mobile phone and an electronic book.

78. (Currently Amended) A method of manufacturing a semiconductor device comprising the steps of:

providing a crystalline semiconductor film comprising silicon over a substrate, said crystalline semiconductor film containing a metallic element;

forming a semiconductor film over the crystalline semiconductor film;

adding ~~an inert~~ a noble gas element ~~[[into]]~~ to an upper layer of the semiconductor film;

gettering the metallic element into the semiconductor film to remove or reduce the amount of the metallic element within the crystalline semiconductor film.

79. (Currently Amended) A method of manufacturing a semiconductor device according to claim 78, wherein the ~~[[inert]]~~ noble gas element is added into an upper surface of the semiconductor film.

80. (Currently Amended) A method of manufacturing a semiconductor device according to claim 78, wherein the semiconductor film comprises a first semiconductor film and a second semiconductor film comprising ~~an inert~~ a noble gas element on the first semiconductor film.